Bantam

Installation Guide

Part No. 875-0265-000 Rev B1

Hemisphere GPS

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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Hemisphere GPS Precision GPS Applications

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The Outback S™ and S-Lite™ automated navigation and steering guide systems are covered by U.S. Patents No. 6,539,303 and No. 6,711,501. The Outback Hitch™ automated hitch control system is covered by U.S. Patent No. 6,631,916. The Outback eDriveTC™ GPS assisted steering system is covered by U.S. Patent No. 7,142,956. Hemisphere GPS products may be covered by one or more of the following U.S. Patents:

6,111,549	6,397,147	6,469,663	6,501,346	6,539,303
6,549,091	6,631,916	6,711,501	6,744,404	6,865,465
6,876,920	7,142,956	7,162,348	7,277,792	7,292,185
7,292,186	7,373,231	7,400,956	7,400,294	7,388,539
7,429,952	7,437,230	7,460,942		

Other U.S. and foreign patents pending.

Notice to Customers

Contact your local dealer for technical assistance. To find the authorized dealer near you:

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Chapter 1: Getting Started

Parts List
Component Weights
Planning the Installation

The Bantam is a modular system that features a powerful CPU in a rugged aluminum box. The CPU contains a serial port for each module. Each module of the system connects to the CPU via a specific cable.

The system modules that ship with the Bantam and connect to the CPU are:

- 7”or 8.4” color touchscreen
- Lightbar
- Antenna
- Optional switches (spray on/off, swath advance)

⚠WARNING: Read this entire manual before beginning installation. Failure to follow the instructions in this manual could void your warranty.

Pay careful attention to safety reminders and warnings to eliminate the possibility of personal injury or damage to the system. Comply with all electrical connections and requirements to prevent damage to the system.

Parts List

Review the contents of your Bantam purchase to ensure the components are not damaged. The contents will vary depending on whether you ordered a 7” or 8.4” screen.

Table 1-1: Bantam main parts list

Component	Part Number	Qty
Bantam switches and kits. See Table 1-2.	880-1031-000	
Bantam cables. See Table 1-3.	880-1030-000	
Bantam CPU	806-1062-000#	1
Bantam Installation Guide (this manual)	875-0265-000	1
AirTrac User Guide	875-0105-001	1
AirTrac Quick Reference Guide	875-0136-001	1
A21 L-Band antenna (with mounting template)	804-3036-000#	
Color touchscreen - 7” *or* Color touchscreen - 8.4”	380-0016-000# 806-3015-000	1 1
Lightbar - V1	806-2011-03A	1
Lightbar cable	051-0022-001	1
Antenna cable	052-0005-000#	1

Table 1-2: Bantam parts list - switches and kits

Component	Part Number	Qty
Warranty statement	875-0066-001	1
Push switch (for use with GPIO cable 051-0244-000#, see Table 1-3). This is the optional swath advance switch.	075-4002-000	1
Lever switch (for use with GPIO cable 051-0244-000#, see Table 1-3). This is the spray on/off switch.	075-4001-000#	1
Lightbar mounting kit. See “The Lightbar Mounting Kit” on page 11.	710-0029-002	1
MapStar kit (CD and MapStar User Guide)	710-0021-007	1
USB kit (extension cable, USB connector, USB flash drive). See “Inserting and Removing the USB Flash Drive” on page 22.	710-0087-000	1
Mounting kit - 7” touchscreen (mounting plates with mounting template). See “Mounting the 7" Touchscreen” on page 8. *or* Mounting kit - 8.4” touchscreen (ball sockets and arm mount). See “Mounting the 8.4" Touchscreen” on page 9.	710-0096-000# 604-0013-000#	1 1
2GB USB flash drive (spare)	750-1083-000	1

Table 1-3: Bantam parts list - cables

Component	Part Number	Qty
Lightbar cable (CPU to lightbar)	051-0022-001	1
Video cable (CPU to touchscreen)	051-0243-000#	1
GPIO cable (CPU to optional spray on/off switch, optional swath advance switch, serial [DB9] connector)	051-0244-000#	1
Antenna cable	052-0005-000#	1
Power cable assembly. (Includes mountable panel with power switch [for the CPU], circuit breaker and dimmer switch to control the lightbar brightness.)	726-1096-000#	1

Component Weights

Table 1-4: Component weights

Component	Weight
CPU	8.58 pounds (3.89 kg)
Touchscreen - 7”	1.35 pounds (0.61 kg)
Touchscreen - 8.4”	4.46 pounds (2.02 kg)
Lightbar V1	4.2 pounds (1.91 kg)
Complete cable set	7.0 pounds (3.18 kg)
Antenna	0.75 pounds (0.34 kg)

Planning the Installation

⚠WARNING: Before beginning the installation, plan it by considering:

- Cable lengths
- Clearance space
- Power source
- Vehicle structure
- Visibility
- Balance (air installations)

In planning your installation locations, see Chapter 3, “Connecting the CPU” for a visual overview of how the components are connected.

Chapter 2: Mounting the Components

CPU

Touchscreen

Power Panel

Lightbar

Antenna

Before installing any components, read the short section “Planning the Installation” on page 4.

⚠WARNING: Review all warnings in Chapter 3, “Connecting the CPU” before attempting to connect any of the components together using the supplied cables. Connecting cables improperly can damage your system.

⚠WARNING: Consider using existing hardware and hardware locations. Avoid drilling holes that may damage other equipment (such as structural frame members, electrical cables, or fluid lines).

Where hardware, such as screws, washer and nuts, is not provided for a particular mounting or installation, you will need to provide the hardware appropriate to your particular needs.

CPU

The CPU is a semi-permanent fixture once installed—there is no quick release mechanism.

Install the CPU in any location inside the vehicle that has the necessary room and is sheltered from the elements, for example in a storage compartment, in the cab, behind the seat. The CPU must have sufficient clearance to be accessible for attaching/removing cables (front and both sides) and for inserting and removing the USB flash drive (however, see “Inserting and Removing the USB Flash Drive” on page 22).

Obtain the necessary hardware to secure the CPU through its fitting points at each corner and install it in your selected location.

⚠WARNING: Do not mount the CPU vertically. The CPU must be mounted on a horizontal surface.

Touchscreen

Mount the touchscreen inside the cockpit or cab of the vehicle where it is:

- Easily visible while flying or driving
- Within arm’s reach

⚠WARNING: Do not obstruct the view or access to other instruments or the flying or driving visibility of the pilot or driver.

The 7” Touchscreen Mounting Kit

Note: You will need to be able to get behind the dashboard to secure the dash mounting plate.

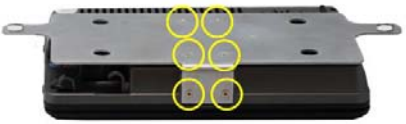
The 7”touchscreen comes with a template, mounting plates and mounting hardware as follows:

Table 2-1: 7” touchscreen mounting kit

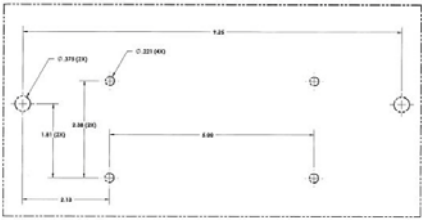
Item	Description/usage	Part Number	Qty
1	Touchscreen mounting plate. Mounts on the touchscreen for mounting on the dashboard plate (item 5).	601-1203-000#	1
2	Screws, flat head M2.5 x 8 mm - secure plate to back of touchscreen.	675-1207-000#	4
3	Screws, flat head M2.5 x 5 mm - secure plate to base of touchscreen.	675-1137-000#	2
4	Template for the dashboard mounting plate. Cut out and stick on the dashboard, drill as indicated.	N/A	1
5	Dashboard (threaded) mounting plate. Mounts on dashboard. Touchscreen mounting plate attaches to this plate.	601-120000#	1
6	Screw, washer and nut. Attach dashboard plate to dash.	675-1208-000# (screw) 678-10990000000 (washer) 676-1066-000# (nut)	4 4 4
7	Threaded knobs (also known as ‘flowerette thumb screws’). Attach touchscreen and plate assembly to dashboard plate.	679-1011-000#	2

Mounting the 7" Touchscreen

1. Attach the touchscreen mounting plate to the touchscreen. Use the four 8 mm (length) screws into the back of the touchscreen, the two 5 mm screws into the bottom of the touchscreen.

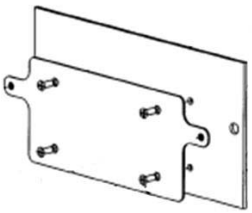


2. Cut out the supplied template and place it on a clear area of the dashboard.

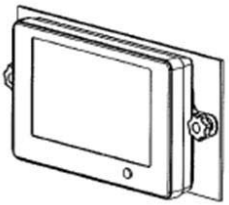


Note: You must be able to get behind the dashboard to attach washers and nuts.

3. Drill the dashboard using the template then, using the four screws, washers and nuts, attach the dashboard mounting plate to the dashboard.



4. Using the two thumb screws, attach the touchscreen and its plate to the dashboard plate.



The 8.4" Touchscreen Mounting Kit

The 8.4" touchscreen comes with a ball mount assembly as follows:

Table 2-2: 8.4" touchscreen mounting kit

Item	Description/Usage	Part number	Qty
1	RAM mount assembly, 10IU	603-1004-000#	1
2	Nut, 8-32 hex self-locking SS Washer, flat, #8	676-1018-000# 678-1010-000	4 4

Mounting the 8.4" Touchscreen

1. Identify the best available location for the ball and arm mount.
2. Using your own hardware, attach one ball mount to a suitable structure/surface on the vehicle.

3. Using the provided nuts and washers, mount the other ball on the studs on the back of the touchscreen.

4. With the arm installed between the two ball mounts, set the touchscreen in a suitable position then tighten the handle. (When loosening the handle, the socket on the sprung side of the arm opens first.)

Power Panel

Power Panel Mounting Location

Mount the power panel—part of cable harness part number 726-1096-000#—inside the cockpit or cab of the vehicle. The power panel must be within arm's reach.

WARNING: Do not obstruct the view or access to other instruments or the flying or driving visibility of the pilot or driver.

Mounting the Power Panel

1. Find an appropriate location in your cockpit or cab to mount the power panel. It must be within easy reach of the pilot or driver.
2. Depending on the selected location and vehicle type, use the appropriate hardware (not supplied) to attach the power panel to the vehicle.

Lightbar

The lightbar installation is the same for aircraft and ground vehicles.

Lightbar Mounting Location

Mount the lightbar in front of the cockpit or cab at a comfortable viewing distance. You can mount the lightbar either inside or outside of the cockpit or cab.

⚠WARNING: Do not block the view of the pilot or driver.

The Lightbar Mounting Kit

The lightbar mounting kit—part number 710-0029-002—contains these items:

Table 2-3: Lightbar mounting kit

Item	Description/usage	Part number	Qty
1	Flat panel plate	603-1005-000 (right side) 603-1006-000 (left side)	2
2	Screw, #8-32 (attach item 1 plate to lightbar)	675-1100-000	2
3	Bracket – 1″	602-1007-000	4
4	Bracket – 3″	602-1008-001	2
5	Backing plate (use with item 8 if required)	601-1045-000	2
6	#10-32 x 5/8″ bolt, nut, and washer set (bolt two x item 3s together, or an item 3 and an item 4 together).	675-1083-000 (bolt) 678-1038-000 (washer) 676-1016-000 (nut)	6 6 6
7	#10-32 x 1/2″bolt, washer and nut set (bolt item 1 plates to item 3 or 4 brackets)	675-1086-000 (bolt) 678-1038-000 (washer) 676-1016-000 (nut)	4 4 4
8	#10-32 x 1¾″ (and ¾″ - optional) bolt, washer and nut set (bolt item 3 or 4 bracket to vehicle - use item 5 backing plates if necessary)	675-1085-000 (1¾″ bolt) 675-1084-000 (¾ bolt) 678-1038-000 (washer) 676-1016-000 (nut)	4 4 4 4

Mounting the Lightbar

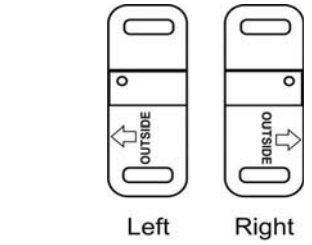
Tools Needed

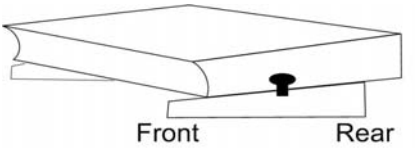
- Phillips screwdriver
- 3/16″ Allen wrench
- 3/8″ wrench
- Electric drill
- 1/4″ drill bit
- Marker pen

Follow this procedure to mount the lightbar.

1. Secure the left and right flat panel plates to the lightbar using the two #8-32 screws.

   Note: The screw holes are offset to the outside edge of the plate. Also, the front of the lightbar faces the thin edge of the plate and the rear of the lightbar rests on the thick edge of the plate.



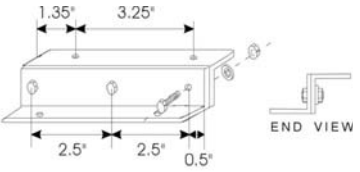


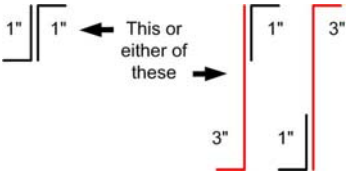
Front of lightbar towards the thin edge of the sloped plates.

⚠WARNING: If you have the left and right plates reversed it is still possible to line up the plates so the arrows are pointing "outside." However, the screw holes on the lightbar and the flat panel plate will not line up if you have them reversed.

2. Assemble the two sets of 1" brackets* using the #10-32 x 5/8" bolt, nut, and washer sets.

   *Substitute a 3" bracket for one of the 1" brackets if added height is needed.



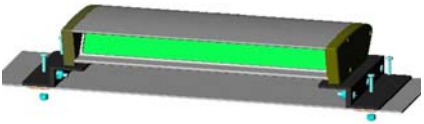


3. Attach the left and right brackets to the lightbar plates using the four #10-32 x 1/2” screw, nut, and washer sets.

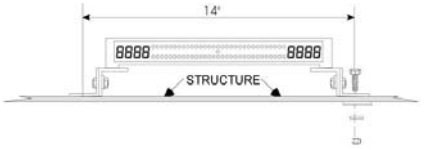
4. Using the assembled lightbar and brackets as a template, mark the four mounting hole locations on the surface of the vehicle.

5. Using a 1/4” drill bit, carefully drill the four holes.

6. Using #10-32 bolts, washers, and nuts secure the lightbar to the vehicle. Use the 1¾” or ¾” bolts depending on if you are mounting the lightbar on a thick or a thin mounting surface



7. If required, attach the backing plates to the underside of the mounting surface for additional reinforcement. The backing plates provide additional support to prevent the bolts from pulling through the surface under vibration.



Antenna

Mounting Location

Antenna position is critical to system performance. These conditions must be met for proper system operation:

- Mount the antenna at least 5 ft (1.524 m) from transmitting antennas of any frequency.

> **WARNING:** Positioning the antenna less than 5 ft (1.524 m) from transmitting antennas of any frequency may cause overloading of RF circuits.

- Mount the antenna at the highest practical point that will give a good view of the horizon.
- The positions that the receiver calculates are at the positions of the antenna. So, if using a swath guidance system, mount the antenna on the center line of the vehicle

Mounting the Antenna

Hemisphere GPS recommends flush mounting the antenna to the roof of the vehicle.

Tools needed

- Phillips screwdriver
- Four #8-32 screws
- Electric drill
- 1/8” drill bit
- 7/16” drill bit
- Marker pen

Follow this procedure to mount the antenna.

1. Use the A21 antenna mounting template to mark the mounting and antenna connector hole locations on the outer surface of the vehicle.
2. Using a 1/8” drill bit, carefully drill the four screw holes.
3. Using a 7/16” drill bit, carefully drill the hole for the antenna connector.
4. Use four #8-32 thread screws to secure the antenna to the surface of the vehicle.

Chapter 3: Connecting the CPU

Warnings
Connections Diagram
Connecting Cables

Warnings

Heed all warnings before continuing. Failure to do so could void your warranty.

General Cable Connection Warnings

⚠WARNING:

- Turn off power before connecting or disconnecting cables. Failing to do so can damage the system.
- Finger-tighten all cable connections. Do not use any tools.
- Do not route cables alongside power generator wire and other high-noise electric sources. This will cause interference.
- Do not kink or force cables into sharp bands. This can damage the cable.
- Store excess cable length with at least a 6-in bend radius.
- Do not coil the cables. This will introduce noise in the system.
- Avoid high-temperature exposure (for example exhaust, manifold) when routing cables.

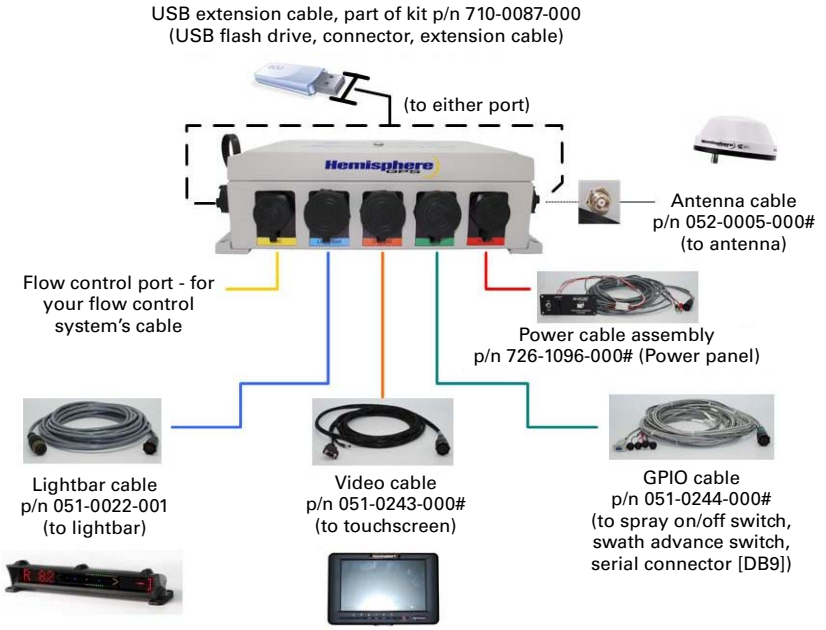
Antenna Cable Warning

⚠WARNING:

- Never connect or disconnect the antenna cable with the power on.
- Do not route the antenna cable with any other radio system cables. This will cause interference. Keep 12 inches apart.
- If you must cross the antenna cable with other cables, do so at a 90° angle. This will prevent interference between systems.

Connections Diagram

The following diagram provides a visual representation of the connections of the Bantam system. Refer to this diagram when planning your installation, and again when you are ready to connect the components.



Connecting Cables

You install each Bantam cable between the CPU and a modular component, for example the antenna cable or the touchscreen, or a peripheral device such as AgLaser. Each cable is labeled with its name and part number and the connections are color coded. Each cable can fit only one port on the CPU—it is impossible to connect a cable to the wrong port.

Line up a connector with its matching pins and gently insert and turn.

⚠WARNING: Never force connections. Finger-tighten only (do not use tools).

Connecting the GPIO Cable

The GPIO cable (part number 051-0244-000) comprises several individual cables: for the spray on/off switch, the swath advance switch, a serial port (DB9) connector.

To connect the GPIO cable:

1. Connect the Conxall connector end of the cable, part number 051-0244-000#, to the CPU serial port labeled 'GPIO'.
2. Connect the spray on/off switch cable leads to the provided momentary lever switch, part number 075-4001-000. Use the switch in conjunction with your spray system on/off controls to synchronize actual spraying with the spray data collection functionality of Bantam. See also "Using the Flow Control Port" on page 18.

   ⚠WARNING: Do not connect spray on/off leads to a flow system if it contains live voltage. Connection to a DC voltage will damage the circuit.

3. (Optional) Connect the swath advance cable leads to push switch, part number 075-4002-000, to control swath advances remotely.

Connecting the Lightbar Cable

1. Connect the Conxall connector of the lightbar cable, part number 051-0022-001, to the CPU port labeled 'LIGHTBAR'.
2. Connect the metal Bendix connector on the lightbar cable to the matching connector on the back of the lightbar.

Connecting the Antenna Cable

Connect the antenna cable, part number 052-0005-000 between the socket on the left side of the CPU and the A21 antenna.

Connecting a Keyboard and/or Mouse

You can connect a keyboard and a mouse that have USB connectors directly or indirectly (through an extension cable) to the USB ports on either side of the CPU.

Using the Flow Control Port

Connect the cable that comes with your flow control system—IntelliFlow or IntelliGate—to the flow control port.

Connecting the Video (VGA) Cable

1. Connect the Conxall connector on cable part number 051-0243-000 to the CPU serial port labeled 'DISPLAY'.
2. Connect the other end of the cable to the red-coded connector on the back of the touchscreen.

About the Power Cable

The power cable assembly—part number 726-1096-000—comprises the following:

- Power panel on which there is an ON/OFF switch
- Dimmer switch to control the lightbar's brightness
- Circuit breaker that prevents voltage spikes and reverse polarity from damaging the system

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Note: The ON/OFF switch powers the CPU and the touchscreens. It powers the 7" touchscreen directly, the 8.4" touchscreen indirectly (see "Powering the System" on page 22). The dimmer switch on the power panel controls lightbar brightness (both touchscreens have their own display brightness controls).

Connecting the Power Cable

⚠WARNING:

- Do not connect to a power source of less than 10 volts.
- Do not use a cigarette lighter as a permanent power source.
- Do not reverse the polarity of the power leads—incorrect installation can damage the system. Connect RED to POSITIVE (+) and BLACK to NEGATIVE (-).

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1. Connect the Conxall connector to the CPU port labeled 'POWER'.
2. Connect the red and black power leads to a suitable power source that can supply between 10 and 36 V (for example, vehicle battery, generator).

⚠WARNING: **(Air Installation)** A potential problem when installing an electronic system in a vehicle is Counter Electromagnetic Force (CEMF). CEMF is caused when relays or solenoids connected to the common vehicle DC power bus are de-energized. The voltage produced may exceed 400 V. CEMF can be produced by equipment such as:

- Electric fan brakes
- Air conditioners
- Starter relays
- Electric pump relays

To eliminate CEMF, install diodes at the relays and solenoids that cause the CEMF and at the power supply cable connection of the SLX system. Use a 47 V, 5 W Zener Diode (1N5368 or equivalent).

Connecting the USB Extension Cable

To enable you to easily connect the USB flash drive to one of the CPU's side USB ports, kit part number 710-0087-000 includes an extension cable. Connect the extension cable to either USB side port on the CPU then, using the connector (adaptor), connect the USB flash drive to the extension cable. See also "Inserting and Removing the USB Flash Drive" on page 22.

Note: You can use the other USB side port for a peripheral device such as a wireless modem, tracking device, keyboard or mouse.

Chapter 4: Operating Bantam

Powering the System
Inserting and Removing the USB Flash Drive
Understanding the 7″ Screen Control Panel
Adjusting the Display Brightness
Adjusting the Lightbar Brightness
Calibrating the Touchscreen
Turning the System Off

Now that the system is installed and connected, you are ready to turn it on and use the USB, adjust the display and lightbar brightness, and calibrate your touchscreen.

Powering the System

The ON/OFF lever switch on the power panel (see “About the Power Cable” on page 19) provides power to the CPU and to the touchscreen but slightly differently for each screen size. When the panel lever switch is turned on:

- The 7" screen is powered directly (even though it has its own power button).
- The 8.4" screen is not powered directly—you have to press its own power button.

Once both screens are on, you can turn them off and on with their own power buttons as long as the panel lever switch is on.

Turning the CPU and Screens On

Turn on the vehicle’s main power source (vehicle battery, generator, other) and set the ON/OFF lever switch on the power panel to ON. This powers up all components except the 8.4" touchscreen. For the 8.4” touchscreen only, then, also press the power button on the front control panel.

When the system is powered up it will start the Window-based AirTrac software.

Note: Refer to the AirTrac User Guide for detailed descriptions of the software features and step-by-step instructions on how to use them for basic and advanced operations.

Inserting and Removing the USB Flash Drive

The Bantam system comes with a 2GB USB flash drive for logging and for transferring files. It also comes with an extension cable so you can access a USB port in the CPU remotely (the CPU has two USB ports, one each side). That is, you can plug the extension cable (part of the USB kit part number 710-0087-000) into either CPU USB port and run the cable up to a convenient location in your cockpit or cab. You can then connect the USB flash drive to the extension cable using the supplied connector.

Note: To use the USB flash drive, you must insert it into the CPU (using the remote connector as required) before turning the system on. If you start the system before inserting the USB, turn off the Bantam*, insert the USB and restart the system. (*Always turn off the Bantam before removing the USB.)

Understanding the 7” Screen Control Panel

This section provides a brief description of the functions of the buttons and lights on the control panel area of the 7" touchscreen.

What the buttons do sometimes depends on whether the M (Menu) button has already been pressed, that is, if an on-screen menu is open. Table 4-1covers both situations.

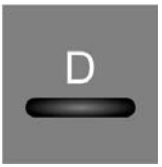
Table 4-1: The 7" touchscreen control panel

Panel Item	Description and Usage
D (Display)	Display brightness. Press to cycle through brightness levels Bright, Mid or Dark. See also “Adjusting the Display Brightness” on page 24.
	Menu closed: Increase/decrease volume (not used). Menu open: Increase/decrease value of selected menu row or switch between two values.
S (Source or Select)	Menu closed: Source - cycle through input sources - AV1, AV2, PC. Menu open: Select - move through the menu options (rows).
M (Menu)	Call up on-screen menus (press twice to access second level menu). Use S to select row, use arrows to change values.
(on/off)	Power on/off button. While ON/OFF lever switch on the power panel is ON, turns screen off and back on. See also “Turning the System Off” on page 25.
(power)	When on, screen is powered (power button and power lever ON/OFF switch both on).
	Not used

Adjusting the Display Brightness

You adjust the display brightness differently for the 8.4” and 7” touchscreens.

8.4” screen



7” screen

To adjust the display brightness of the 8.4" touchscreen, press the brightness up and down arrow buttons.

To adjust the display brightness of the 7" touchscreen, press the D (Display) button on the control panel (below the screen) to cycle the display brightness through Bright, Mid, Dark.

You can also adjust the 7" screen brightness if you have the first menu open by using S to select the Brightness row (if necessary) and using the panel’s up and down arrows to change the display brightness to another of the three levels.

Adjusting the Lightbar Brightness

Adjust the lightbar brightness for night operation by turning the lightbar DIMMER control knob on the power panel.

Calibrating the Touchscreen

Both the 7" and 8.4" touchscreens are shipped properly calibrated. Touchscreen calibration ensures that the cursor is placed exactly under your finger when you touch the screen.

If you need to recalibrate your touchscreen:

1. Power on your Bantam AirTrac system.
2. On the Disclaimer screen press **ACCEPT**.
3. On the Select Additional Options / Confirm Logging Device screen press **Exit to Windows**. The Welcome splash screen appears briefly.
4. On the Windows desktop, double tap **Touchkit**.
5. Select the **Tools** tab.
6. Select **4 Points Calibration**.
7. Touch and hold the center of the cross hairs until “OK” appears, and then repeat for the other three points.
8. On the “Completed” message press **OK**.
9. Close the Touchkit window.
10. Shut down Windows and power off the system (see the next section, “Turning the System Off”).

Turning the System Off

Before turning off the touchscreen or the main power source, it is important to shut down Windows by following this procedure.

1. Press the **Start** button in the lower left hand corner of the Windows screen.
2. Press **Shut Down**.
3. Highlight the **Shut Down** choice then press **OK**.
4. Wait until you see the message "It's now safe to turn off your computer."
5. Shut down power to the touchscreen by pressing the **Power** button (8.4" touchscreen only). For the 7" touchscreen go to step 6.
6. Turn off system power.

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